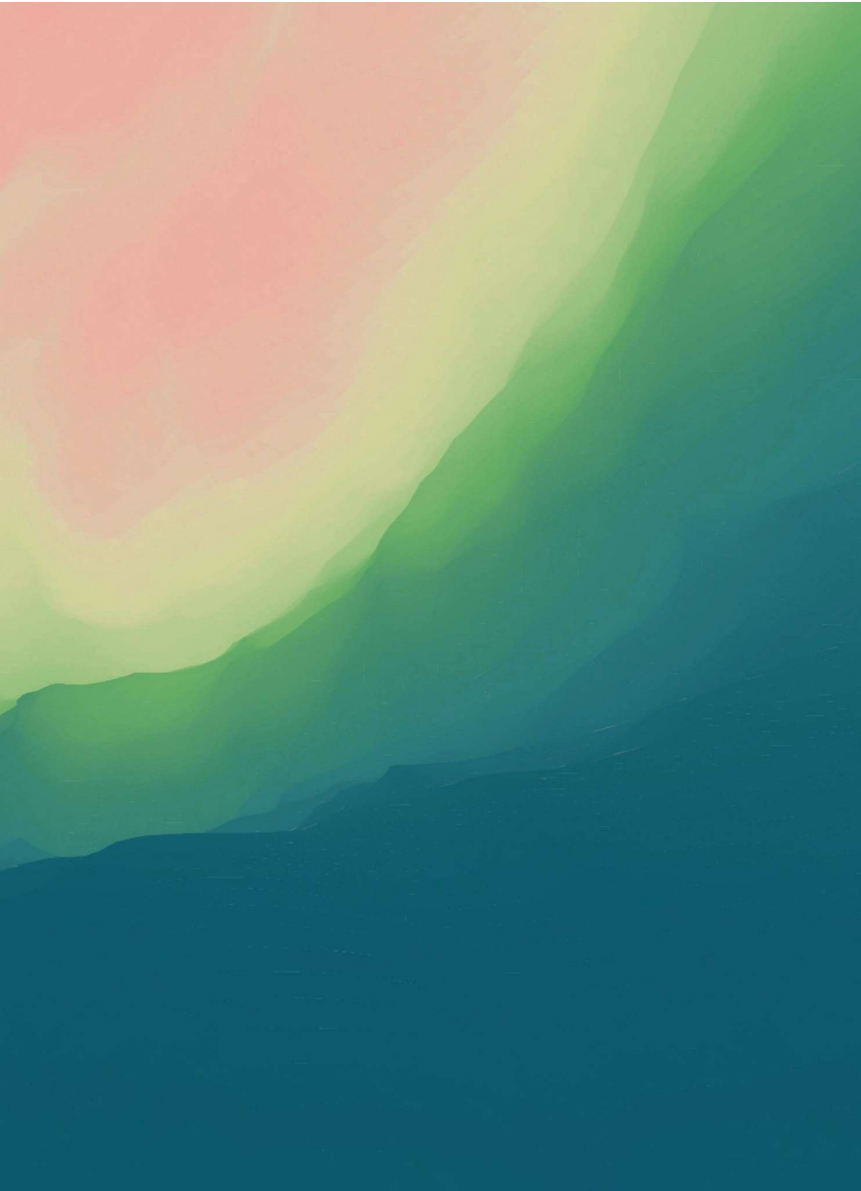




Colon Cancer Screening: Updates and Controversies

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Disclosure

none

Objectives

To define the best practices that lead to colon cancer prevention

To review types of polyps and their consequences

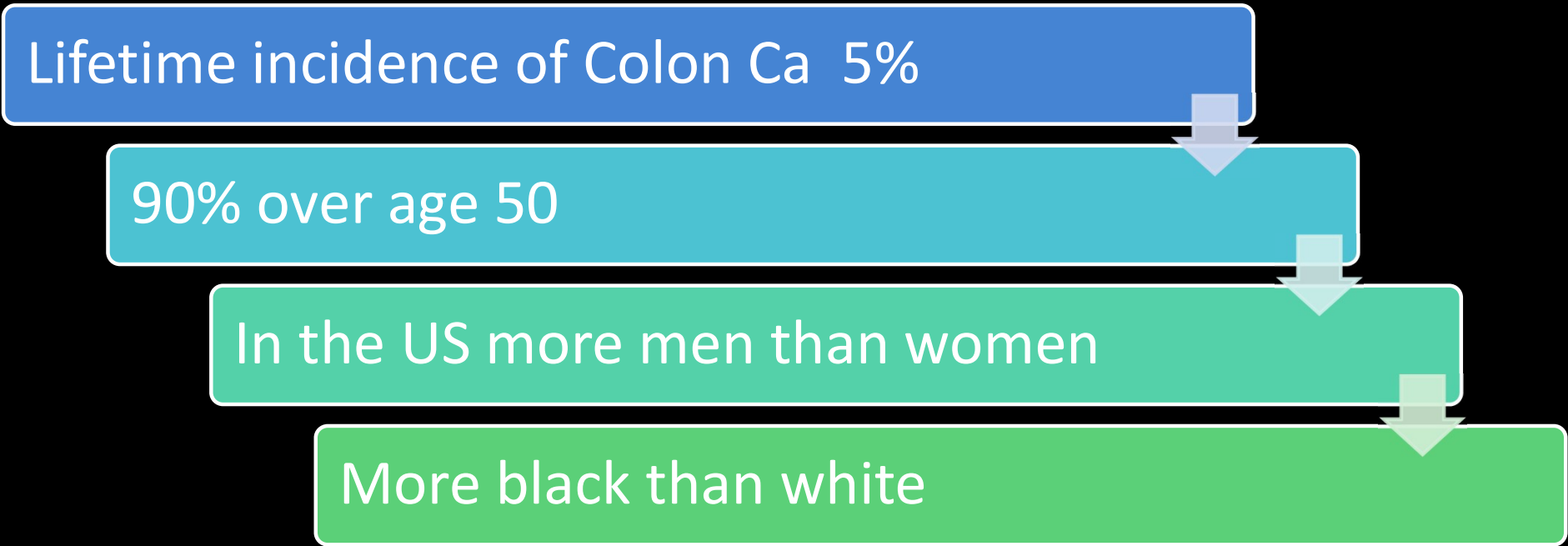
To review the pitfalls of colonoscopy screening

To list alternatives to colonoscopy

To reduce the number of inappropriate colonoscopies

Just the Facts

Lifetime incidence of Colon Ca 5%



```
graph TD; A[Lifetime incidence of Colon Ca 5%] --> B[90% over age 50]; B --> C[In the US more men than women]; C --> D[More black than white];
```

A vertical flowchart with four colored rectangular boxes containing text. The boxes are blue, teal, green, and light green, arranged from top to bottom. Each box is connected to the one below it by a downward-pointing arrow. The background is black, and the entire slide is framed by a light green border with a subtle leaf pattern.

90% over age 50

In the US more men than women

More black than white

How long is the sequence
of normal colon-polyp-
colon cancer?

1. 1 year
2. 5 years
3. 10 years
4. 20 years



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Family History and Colon Cancer Risk

Mother and Father with CRC (**30%**)



First degree relative < 50 years old with CRC (**20%**)



First degree relative > 50 years old with CRC (**12%**)



General population (**5%**)

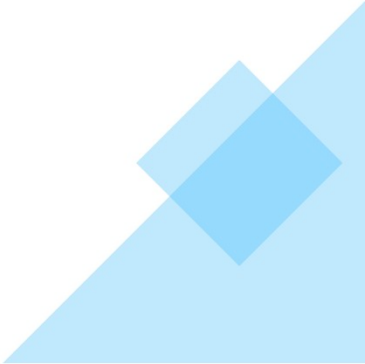
Risk Factors for Colon Ca



- Age
- Family History
- History of previous colon cancer
- Inflammatory Bowel Disease



Which of the following
are risk factors for colon
cancer:

1. Race, ethnicity, gender
 2. Diabetes
 3. Alcohol
 4. Cigarette smoking
 5. NSAID use
- 

Should ASA/ NSAIDs be
routinely used to prevent
colon cancer?



Should ASA/ NSAIDs be routinely used to prevent colon cancer?

- Regular use of ASA/NSAIDs reduce the risk of colon adenomas and colon cancer by 20-40%
- Routine use of ASA/NSAIDs to prevent colon cancer; **risks outweigh benefits**

Chan AT and Ladabaum U

Where do we stand with aspirin for the prevention of colorectal cancer? The USPSTF recommendations.

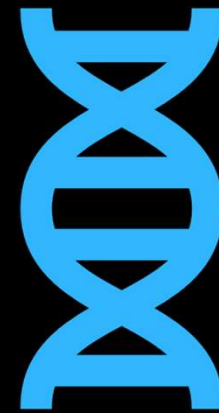
Gastroenterology 2016;150;14

Nafisi S et al

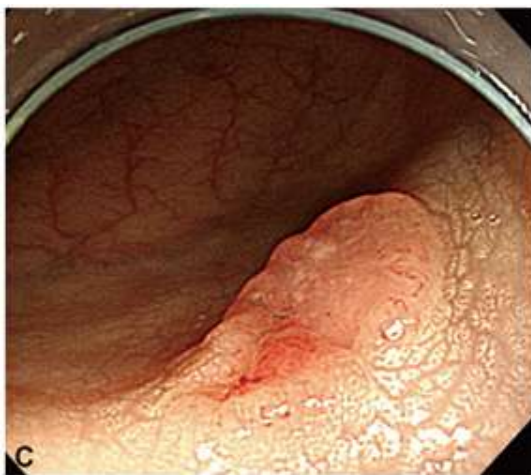
Low-Dose Aspirin and Prevention of Colorectal Cancer: Evidence From a Nationwide Registry-Based Cohort in Norway

Am J Gastroenterol 2024;119;1402

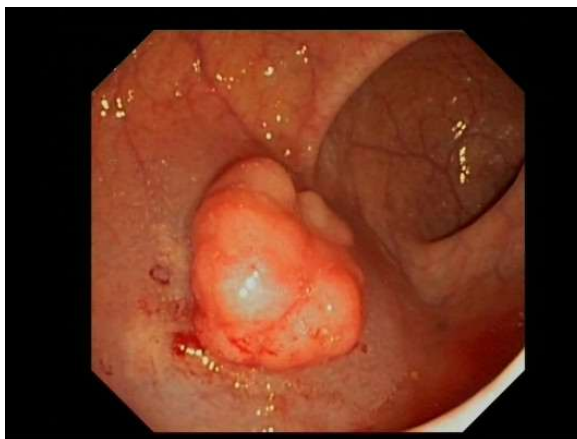
Common Colon Polyps



- Gradual shift to right colon lesions

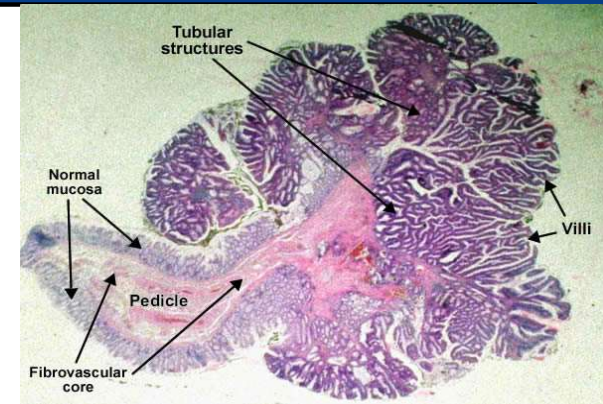


- Biology different between right and left lesions



Adenomatous Polyps

- Most common polyp
- 2/3 of colon polyps are adenomatous
- Subtypes: tubular, villous, tubulovillous
- Source of most of colon cancers
- **Less than 5% of all polyps become cancerous**



Advanced Adenomas

- More cancer potential than adenomatous polyps
- Generally larger than adenomatous polyps
- Often sessile (broad based)



Serrated Lesions (3 TYPES)

1. **HYPERPLASTIC POLYPS** = no
malignant potential

account for 70-95% of all
serrated polyps

mostly located in distal colon



Serrated Lesions

2. Sessile Serrated Polyp

Heterogenous polyps with varying malignant potential

Most common precancerous serrated polyp

Mostly **proximal** colon



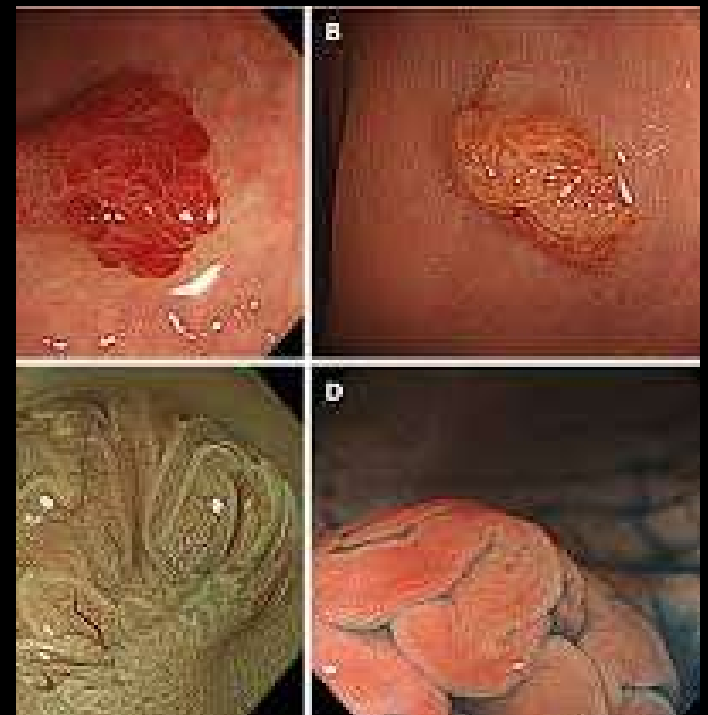
Serrated Lesions

3. Traditional serrated adenoma

Very uncommon

Located in rectosigmoid

Significant malignant potential



Polyps as source of colon Ca

80% from
adenomatous polyps

20% from serrated
polyps

What is the best test to screen for colon cancer?

1. Colonoscopy
2. Fecal Immunochemical Testing (FIT)
3. Multi target DNA (Cologuard)
4. Capsule study



What is the best test to
screen for colon
cancer?

The one that gets done!

What is the best test to screen for colon cancer?

The one that gets done and gets done well!

Fact

- Colonoscopy is the dominant screening modality in the US
- FIT testing widely used in the rest of the world
- A “one size fits all” approach to colon cancer screening limits utilization

Melson JE et al

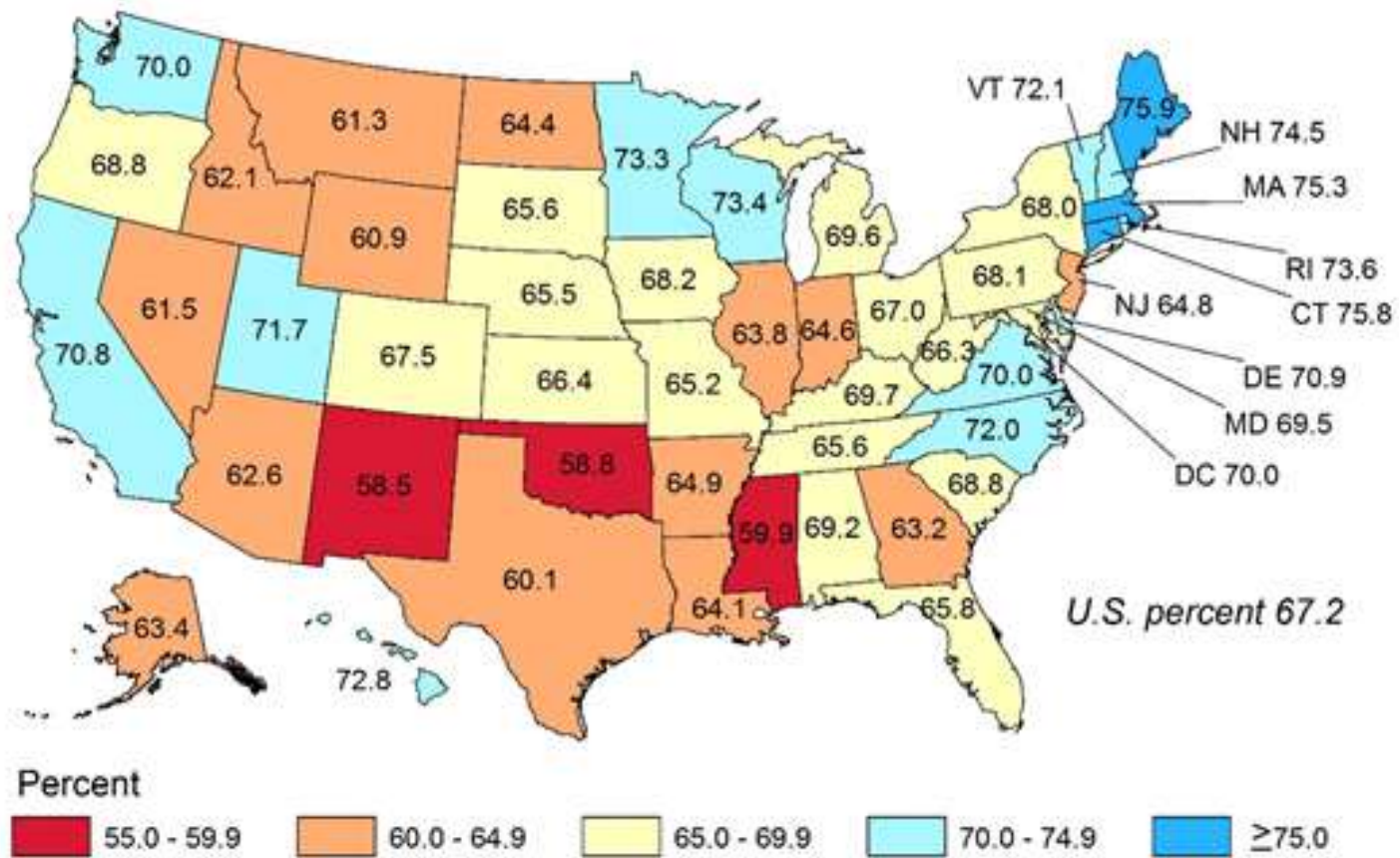
AGA White Paper: Roadmap for the Future of Colorectal Cancer Screening in the United States

Clinical Gastroenterology and Hepatology pre proof 2020 <https://doi.org/10.1016/j.cgh.2020.06.053>

Berwald G et al

The Diagnostic Performance of Fecal Immunochemical Tests for Detecting Advanced Neoplasia at Surveillance Colonoscopy

Clin Gastroenterol and Hepatol 2024;22:878



How Often
Can a
Positive
Guaiac Test
Predict
Colon Ca?

1. 10%

2. 30%

3. 50%





What foods
cause a false
positive
Guaiac?



What foods
cause a
false
positive
Guaiac?



Red meat



Cantaloupe



Grapefruit

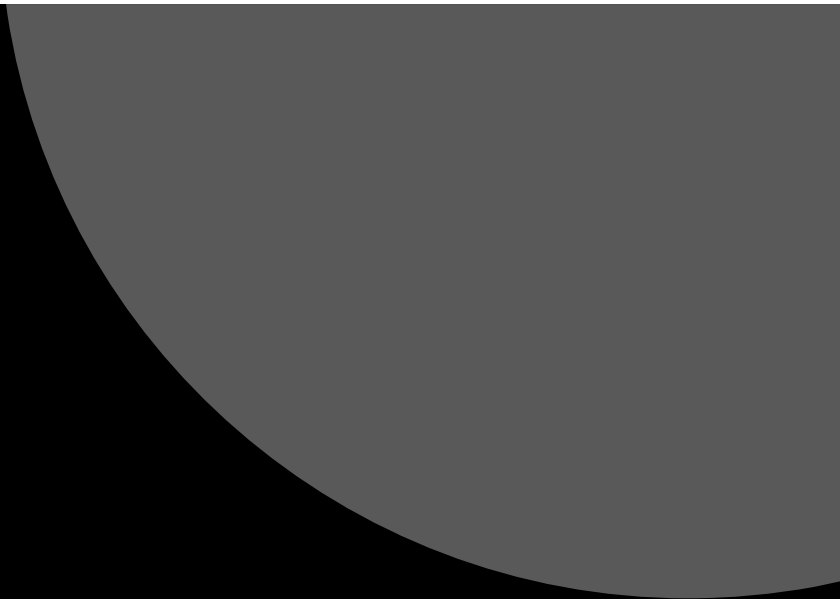
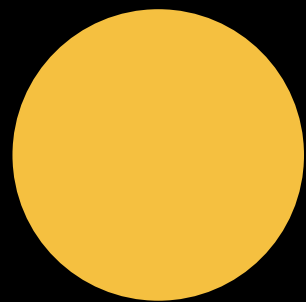


Horseradish

The Multi Society Task
Force on Colorectal Ca no
longer recommends
Hemoccult testing for colon
cancer screening

Rex DA et al
Colorectal cancer screening:
recommendations for physicians and patients
from the US Multi Society Task Force on
Colorectal Cancer
Am J Gastroenterol 2017;112;1016





What are the pros and cons
of using a FIT test or Multi-
target stool DNA Test?

FIT and Multi-target stool DNA test



- Are TWO STEP Screening Tests

Fecal Immunochemical Testing (FIT)



- **Pro**
- **No diet or med restrictions**
- **Sensitivity for Ca 79%**
- **Specificity for Ca 94%**
- **Not useful/active bleed****

Lee JK et al

Accuracy of fecal immunochemical tests for colorectal cancer: systematic review and meta-analysis
Ann Int Med 2014;160;171

A hand in a white sleeve holds a large, 3D white question mark. The background is a dark gradient with a curved light grey shape behind the hand.

Does immediate repetition of a FIT test improve its detection rate?

Lee JK et al

Accuracy of fecal immunochemical tests for colorectal cancer: systematic review and meta analysis

Ann Int Med 2014;160;171

BUT

The sensitivity
and specificity
of a FIT test
increases over
yearly
repetition





Mike, the intern

- Asks whether he needs to stop aspirin prior to doing a FIT test?
- How do you answer?

Brenner H et al

Low-dose aspirin use and performance of immunochemical fecal occult blood tests
JAMA 2010;304:2513

Multi-target stool DNA test (Cologuard)

- Pros
- No diet or med restrictions
- Sensitivity for Ca 92%
- Specificity for Ca 86.6%
- Cons
- Not useful with bleeding
- **10-15% false positive in elderly**



Imperiale TF

Multitarget Stool DNA Testing for Colorectal_Cancer Screening
NEJM 2014;370;1287

Multi-Target Stool DNA (Cologuard Plus)

- Released in April 25
- High sensitivity and specificity as per manufacturer's studies





Mollie

- Age 62 asks for a non invasive test to check for colon cancer
- You offer a FIT test
- It is positive
- Mollie asks if this can be confirmed with a “Cologuard” test
- How do you answer?

FIT/Multi-target stool DNA test (Cologuard) **Testing Agreement**

- **Either FIT or Multi-target stool DNA test not both**
- Colonoscopy mandatory for FIT or Cologuard positive patients
- Only 54% of positive FIT test patients had a colonoscopy performed*
- Non compliance with colonoscopy after positive FIT, doubles risk of dying from colon Ca **

*Lee Y-C et al

Time to colonoscopy and risk of colorectal cancer in patients with positive results from fecal immunochemical tests
Clin Gastroenterol Hepatol 2019;17;1332

**San Miguel Y et al

Time to colonoscopy after abnormal stool-based screening and risk for colorectal incidence and mortality
Gastroenterology 2021;160;1997

Patient Navigation

- Significantly boosts follow up colonoscopy after a positive stool test

Coronado GD et al
Patient Navigation to Improve Colonoscopy Completion After an Abnormal Stool Test Result
Annals of Int Med 2025;178;645



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When screening for family history of hereditary colon cancer or inflammatory bowel disease, what is the best test to evaluate for colon cancer?

1. FIT test
2. Cologuard test
3. Colonoscopy



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Colon Ca Screening Guidelines

- Tier 1: colonoscopy every 10 years OR Annual FIT test
- Tier 2: CT colonography every 5 years
FIT-fecal DNA test every 3 years
Flexible sigmoidoscopy every 5-10 years
- Tier 3 Capsule colonoscopy every 5 years
- Shield™ blood test?

Rex DK

Colorectal Cancer Screening: Recommendations for Physicians and Patients From the US Multi-Society Task Force on Colorectal Cancer
Am J Gastroenterol 2018;112;1016

** Chung DC et al

A Cell-free DNA Blood-Based Test for Colorectal Cancer Screening
NEJM 2024;390:973

Blood Test for Colorectal Cancer Screening (Shield™ and Freenome™) now FDA approved

- A blood test every three years will encourage even more patients to be screened

Shaukat A et al

AGA Clinical Practice Update on Current Role of Blood Tests for Colorectal Cancer Screening: Commentary
Clinical Gastroenterology and Hepatology 2025;23;1486

Prediction Models for Reduction in Colorectal Cancer Incidence

Annual FIT 45-77%

Triennial multitarget DNA 40-73%

Colonoscopy every 10 years 57-81%

Blood tests every 3 years 24-47%

Ladabaum U et al

Projected Impact and Cost Effectiveness of Novel Molecular Blood-based or Stool –based Screening Tests for Colorectal Cancer

Ann Int Med 2024;177;1610

When should we stop routine screening colonoscopies?

1. Age 70

2. Age 80

3. Age 85

Patel SG et al

Updates on age to start and stop colorectal cancer screening: recommendations from the U.S. Multi-Society Task Force on Colorectal Cancer
Am J Gastroenterol 2022;117;57

Reinink AR et al

Colon cancer screening and end of life: is age just a number?
Am J Gastroenterol 2023;118;432

Evolving Data

- Screening **APPROPRIATE** candidates older than 75 can reduce risk of colorectal cancer by 40%

Ma W et al

Association of screening lower endoscopy with colorectal cancer incidence and mortality in adults older than 75 years

JAMA Oncology 2021;7;985



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Evolving Data Counterpoint

- The non GI risks of colonoscopy are more common over age 75
- Weigh the risks/benefits

Ladabaum U et al
Age Specific Rates and Time-Course of Gastrointestinal and
Nongastrointestinal Complications Associated With
Screening/Surveillance Colonoscopy
Am J Gastroenterol 2021;116;2430



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Helen

Age 60 has been scheduled to get colonoscopies every 2 years since a 1 cm polyp was detected and removed 10 years ago

Is this correct?

Increased Risk: People With History of Polyps or Colon Ca

Risk Category	When to Test
1 – 2 adenomatous polyps under 1 cm	7 – 10 years
1 or more adenomatous polyps over 1 cm	3 yrs
Newly dx colon ca	Then in 1 year followed by every 3-5 years**

Gupta S et al

Recommendations for follow up after colonoscopy and polypectomy: a consensus update by the US Multi-Society Task Force on Colorectal Cancer

Gastroenterology 2020;158;1131

Inappropriate Colonoscopies

29% of colonoscopies inappropriate

Surveillance, the most frequent component

Petruzziello L et al

Appropriateness of the Indication for Colonoscopy/ Is the Endoscopist the "Gold Standard"

Journal of Clinical Gastroenterology 2012;46;590

Kapila N et al

Open Access Colonoscopy for Colorectal Cancer Prevention: An Evaluation of Inappropriateness and Quality

Digestive Diseases and Sciences 2019;64;2798

Harry

- Age 49 has just been diagnosed with two adenomatous polyps sized 1.5 cm and 2 cm.
- When should his first degree relatives get their colonoscopies?



Harry's Relatives

- 10 years before the age of diagnosis or at age 40 whichever is earlier
- Then colonoscopy every 5 years

Molmenti CL et al

Advanced Colorectal Polyps on Colonoscopy: A Trigger for Earlier Screening of Familial Members

Am J Gastroenterology 2020;115;311

Additional Reasons for Aggressive Screening Guidelines

- All individuals with a first degree relative diagnosed with colon cancer (especially < 50) are at increased risk of colon cancer

Issaka RB et al

AGA Clinical Practice Update on Risk Stratification for Colorectal Cancer Screening and Post-Polypectomy Surveillance: Expert Review
Gastroenterology 2023;165:1280

Where is
the polyp?



Endoscopic examination



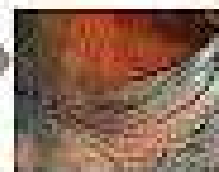
Alarm



Real-time endoscopic diagnosis support system in colonoscopy

AI algorithm to detect lesion shape
using deep learning

Unique high-speed
processing algorithm + GPU



Endoscopic diagnosis

- ✓ Color tone
- ✓ Roughness
- ✓ Boundary



Realization of
"digital revolution" by the
combination of AI and
hardware

Real-time feedback



What percentage of
patients coming to
the GI lab have a
poor prep?

1. 10%

2. 20%

3. 30%



Why do patients have poor bowel prep?

- Diabetes
- Opioid use
- Anticholinergics including TCAs
- Neurologic disease
- Prior poor prep
- Limited education
- Non English speaker

Schoenfeld P
ACG 2023



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Improving Bowel Preps

- Use phone apps (Colonoscopy Helper, Easy Prep Colonoscopy)
- Trained patient navigators
- And
- Follow up phone call 3 – 5 days before colonoscopy

Spiegel BM et al
Am J Gastroenterol 2011

What to do for Poor Bowel Prep Despite Following Directions

- **One prep does not fit all**
- Some patients need a 2 or 3 day prep!

PEG solution

Bisacodyl

Enemas

Linacлотide

Magnesium Citrate or Sulfate

Lubiprostone

Senna

Prucalopride

etc

Jacobson BC et al
Optimizing Bowel Preparation Quality for Colonoscopy: Consensus
Recommendations by the US Multi-Society Task Force on Colorectal Cancer
Gastroenterology 2025;168;798

Irrigation
Pump (helps
clean the
colon)*





If we have an
asymptomatic patient for
a routine screening
colonoscopy and the prep
is POOR, when should
they be re-
colonoscoped?



Todd

- Age 67 had a colonoscopy done last year by an out of town gastroenterologist
- The report was normal
- 2 weeks ago, Todd had a lower GI bleed
- You got especially concerned with the Hgb of 9
- You appropriately ordered a repeat colonoscopy and the GI doc found a massive sigmoid Ca
- What's happening???





Alarm Symptoms

- Rectal bleed
- Anemia
- Fever
- Weight loss

Post Colonoscopy Colorectal Ca (Interval Ca)

- Colorectal cancer diagnosed within a short interval of a previous colonoscopy



Interval Cancer Rate

- Study criteria 6 – 60 months post colonoscopy following positive Hemoccult
- From 2002-2013
- 10,557 normal colonoscopies over that time
- **Interval Ca = 1.1%** of all diagnosed colon cancers

Jennings P et al

A twelve year study of the prevalence, risk factors and characteristics of interval colorectal cancers after negative colonoscopy

Clin Res Hepatol Gastroenterol 2020;44;230

Quality in Colonoscopy is Key!

- Adequate prep*
- Complete polyp resection**
- High cecal intubation rates
- 6 – 8 minute withdrawal time
- Adenoma detection rates: males 30%
females 20%

*Zessner-Spitzenberg J et al
Impact of Bowel Preparation Quality on Colonoscopy Findings and Colorectal Cancer Deaths in a Nation-Wide Colorectal Cancer Screening Program
Am J Gastroenterol 2024;119:2036

**Pohl H et al
Recurrence of Colorectal Neoplastic Polyps After Incomplete Resection
Annals of Int Med 2021;174:1377



Reasons for Interval Cancer

- Poor prep
- Incomplete resection of polyps (up to 20% of polyps 1 – 2 cm size)*
- Missed lesions
- Lack of time spent in examining the rt colon
- **VERY RARELY: de novo cancer occurring without polyp sequence**

*Djinbachian R et al

Rates of incomplete resection of 1 – 20-mm colorectal polyps: a systematic review and meta-analysis
Gastroenterology 2020;159:904





In defense of colonoscopists

Even with high quality
preps by the best
colonoscopists, lesions
WILL be missed

How can you help?

1. Make sure you assiduously refer patients for screening and follow up when appropriate
2. Read the body of the report
3. Ask questions
4. Knowing the polyp detection rate of your colonoscopists
 - 30% men will have polyps
 - 20% women will have polyps

Knowing the polyp detection of your colonoscopist

- There is a significant difference of polyp detection among endoscopists

Bretagne JF et al

Interendoscopic Variability in Proximal Colon Polyp Detection is Twice Higher for Serrated Polyps than Adenomas

World Journal of Gastroenterology 2016;22;8549

Protect Yourself!

Does your practice have an automatic reminder about initial screening?

Do Co Pays get in the way?

How about follow up colonoscopy reminders?



Protect 2

- There are now more than 1 million survivors of colon cancer in the US*
- They clearly need follow up MRI/CT
- Don't forget about the development of non GI cancers

DeSantis CE et al
Cancer treatment and survivorship statistics
J Clinical Ca 2014;64;252

Ron Age 78



- Has a son Bob who developed colon cancer at age 45
- What will you advise Ron?

Young Patients With Colon Ca

- Of 1195 patients studied
 - 71% stage III or IV
 - 63% waited 3 – 12 months to see a provider
 - 67% saw at least two providers before receiving a correct diagnosis

Yarden R et al

Survey of young onset colorectal cancer patients suggest misdiagnosis may be common

AACR abstracts March 2019

Colon Cancer Screening at Age 45

- Colon cancer incidence has declined in patients 50 years and older (likely due to decreased smoking and increased ASA use and increased screening)*
- There has been a 51% increase in colon cancer since 1994 in patients younger than 50
- Patients born around 1990 have 4 times the risk of rectal cancer compared with someone born in 1950

*Patel SG and Dominitz JA
Screening for Colorectal Cancer
Annals of Internal Medicine 2024;177:549

Wolf AMD et al
Colorectal cancer screening for average-risk adults: 2018 guideline update from the American Cancer Society
CA Cancer J Clin 2018;68:250

US Preventive Services Task Force
May 18, 2021

Estimated Number of Colorectal Cancer Cases in 2020 by Age

Age	Colon	Rectum
0-49	11,540	6390
50-64	32,290	17,720
65+	60,780	19,230

American Cancer Society
Colorectal Cancer Facts and Figures 2020-2022
Atlanta: American Cancer Society

“Rising Early-onset Colorectal Cancer Incidence is Not an Artifact of Increased Screening Colonoscopy Use in a Large Diverse Healthcare System”

65% of examinations for symptoms in younger adults

the largest increase in disease burden age 45-49

Most of older patients had colonoscopy for screening purposes

Lee JK et al

Gastroenterology 2022;162;325

When resecting a colon cancer in a 38 y o, the following tests should be done on the resected specimen

UNIVERSAL TUMOR SCREENING Includes:

- Microsatellite instability (MSI)
Cancer cells that have genetic markers called microsatellites
- Immunochemical testing (protein tests)

Lynch Syndrome

Hereditary Non Polyposis Colorectal Ca

- Colon
- Stomach
- Endometrium
- CNS
- Small bowel
- Urinary track
- Pancreas

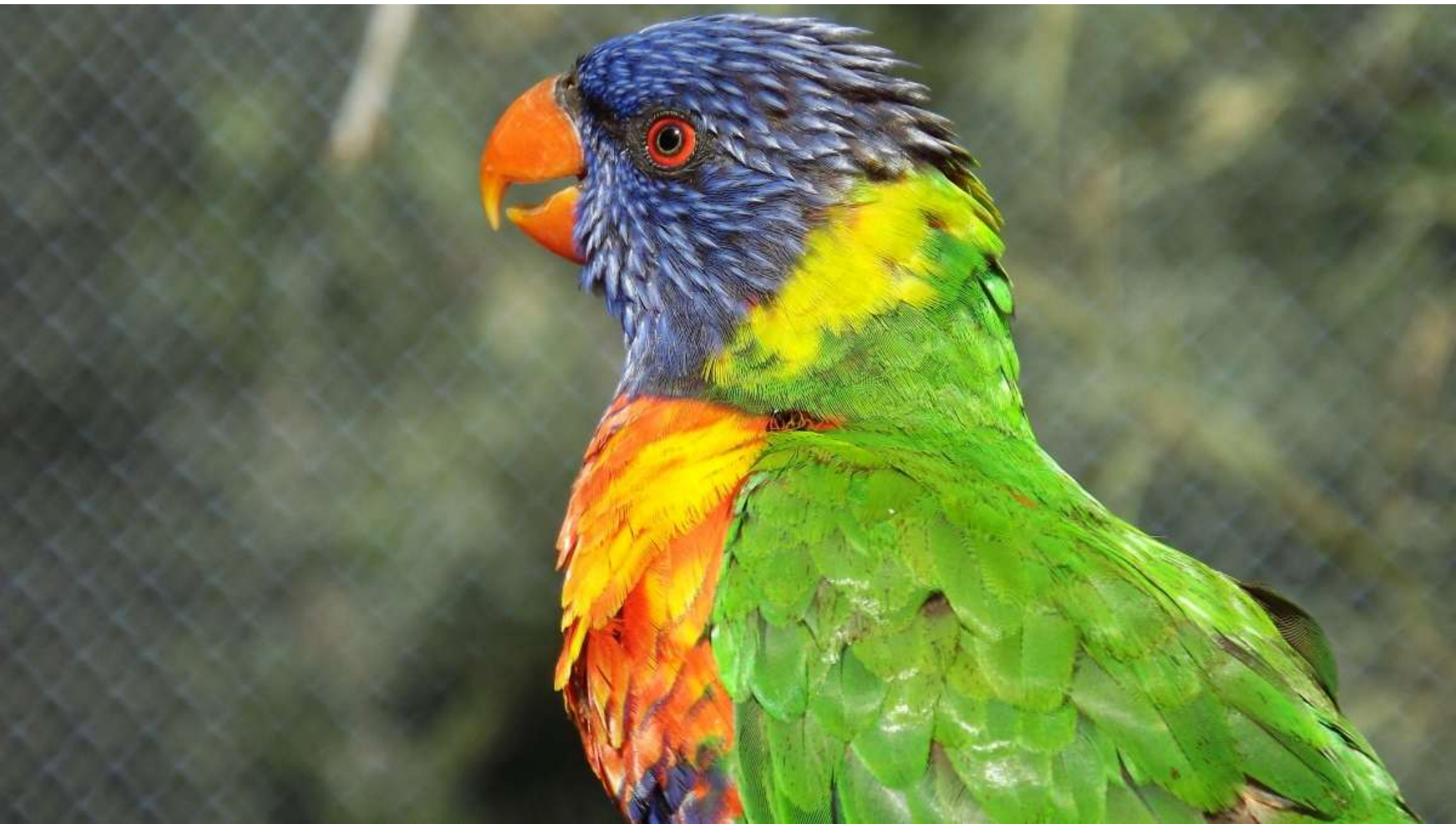
Bethesda Criteria

- Colon Ca under age 50
- Synchronous/Metachronous* or other Lynch Ca
- MSI
- Colon Ca or Lynch in 1st degree relatives under 50
- Colon Ca or Lynch in any two 1st degree or second degree relatives

Risk Calculator for Lynch syndrome

PREMM5
MODEL

LYNCH
SYNDROME



How many screening colonoscopies?

If we screen a healthy individual with no family history of colon cancer, they may actually require 3 – 4 tests in their lifetime

What other regimens are being evaluated?



The Future

- **CONFIRM Trial:**

One time colonoscopy

vs

Annual FIT plus colonoscopy

for

positive FIT

Summary

- The “best” test for colon cancer screening is.....
- Be aware of the false positives and negatives for Fecal Immunochemical Testing and “Multi target DNA” Testing
- Be aware how interval cancer can affect your practice
- Young people can get a much more aggressive form of colon Ca

Thank You!
Peter Buch, MD

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GIEducator.com



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